

The Colorado Front Range Prairie Dog Technical Workshop: An Overview and Summary

Gary W. Witmer

USDA APHIS Wildlife Services, National Wildlife Research Center, Fort Collins, Colorado

Brian T. Hoffmann

EDAW, Inc., Fort Collins, Colorado

Abstract: The 2½-day Colorado Front Range Prairie Dog Technical Workshop was held in Fort Collins, Colorado, February 27-March 1, 2001. The workshop attracted about 250 attendees, mostly government personnel. Black-tailed prairie dogs (*Cynomys ludovicianus*) present numerous challenges to landowners and resource managers because they are considered a rare and important ecosystem component, but at the same time they can cause various kinds of damage and pose a disease hazard to humans and their domestic animals. Invited speakers updated the participants on the topics of prairie dog biology and ecology, legal status and distribution, socio-economic issues, management techniques and strategies, and current research. Special topics such as plague management and black-footed ferret re-introductions were also addressed. Several panel discussions on management challenges and options were held. Various perspectives were presented and there was considerable interaction on these volatile issues. There was a field trip to local prairie dog colonies to view and discuss conflicts and management options. In this paper, we summarize some of the key topics and perspectives brought up at the Workshop, in order to provide a broad synopsis of this highly contentious arena of human-wildlife conflict.

Key Words: black-tailed prairie dog, conservation, *Cynomys ludovicianus*, damage, education, rodent management

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INTRODUCTION

In this paper, we provide a summary of the important topics, issues and controversies, and current management of black-tailed prairie dog (*Cynomys ludovicianus*) populations, based on the information presented by speakers and panels of The Colorado Front Range Prairie Dog Technical Workshop. The Workshop was co-sponsored by the U.S. Fish and Wildlife Service (FWS), USDA Wildlife Services (WS), Colorado Division of Wildlife (DOW), EDAW Inc., Boulder County, and the Cities of Boulder and Fort Collins. One person from each of these agencies (two from the City of Fort Collins) served on the organizing committee. The Workshop was held in Fort Collins, Colorado, February 27 - March 1, 2001. The purpose of the Workshop was to provide a forum on a broad array of topics to update municipal, county, state, and federal employees charged with the responsibility for prairie dog management and decision-making. Specialists and persons representing groups interested in- or potentially affected by- prairie dog regulation and management were invited to make presentations and provide a forum for interaction between managers, researchers, and other interested parties, including the audience of about 250 persons. Abstracts of oral presentations and posters, along with contact information and other general information, were compiled in a workbook and distributed to all attendees. Based on the positive feedback of attendees, and requests for more information and updates on prairie dog status and management, the organizers of the Workshop have begun meeting again to plan a second Workshop to be

held in or near Boulder, Colorado in February, 2003.

Many of the persons involved in the Workshop were also scheduled to speak at a one-day symposium on prairie dogs at the 8th Annual Meeting of The Wildlife Society in Reno, Nevada, on September 28, 2001. The tragic events of September 11th, however, resulted in a postponement of that symposium. Instead, the speakers made their presentations at the Annual Meetings of the Western Association of Fish and Wildlife Agencies in Las Cruces, New Mexico, January 6-7, 2002. Several other "gatherings" related to prairie dog status and management were attended by persons involved in the Workshop. One of these was "A Black-tailed Prairie Dog Workshop" held in Phoenix, Arizona, November 30-December 1, 1999; several papers from this Workshop were published in the Journal of Mammalogy (Volume 82, Issue 4, 2001). Finally, a workshop on "Landscape Ecology of Plague in the American Southwest" was held in Fort Collins, Colorado, September 19-20, 2000.

All of this activity attests to the keen interest in, and considerable controversy surrounding, the legal and biological status of black-tailed prairie dogs and their management. The regulatory interest in this species began when the National Wildlife Federation (NWF) first petitioned the FWS to federally list black-tailed prairie dogs as threatened. The need for information, and the desire of groups to have their perspectives aired and taken into consideration, has led to the many meetings, workshops, and symposia that have occurred. It is the responsibility of personnel from regulatory and management agencies to absorb and reflect on all of this

Table 1. Key topics with related informational needs and issues, as covered in the Colorado Front Range Prairie Dog Technical Workshop, Fort Collins, Colorado, February, 2001.

Conservation	Biology/Ecology	Public Attitudes	Habitat and Vegetation Mgt.	Population Management	Plague Management	Landowner Incentives
Status and range	Social behavior	Survey results	Habitat management tools	Conflict resolution	Exotic disease	Need for private lands
Ecosystem role	Reproduction and mortality	Opposing views	Vegetation impacts	Zone	High susceptibility	Landowner rights
Proposed listing and finding	Population fragmentation	Knowledge levels	Noxious weeds	Relocation	Prediction	Economic incentives programs
Strategies and plans	Dispersal	Public education	Native plant restoration	Barriers	Management of plague	NGO roles
Federal, tribal, state, private roles	Genetic variation			Natural predation	Research needs	
				Toxicants		

input and to make appropriate decisions that, hopefully, all can live with.

We will summarize, from our perspective, the current informational needs and issues under each of several key topics (Table 1). We would also be pleased to provide interested persons with contact information on the various specialists and groups that have been involved in the Workshops, as well as access to pertinent literature on specific topics.

PROPOSED LISTING AND CONSERVATION

Workshop attendees were updated on the legal status and conservation activities surrounding the black-tailed prairie dog. The NWF petitioned the FWS in 1998 to list the species, citing the large decline in historic range and the many factors having negative impacts on populations (Graber and France 1999). In 2000, the FWS issued a "warranted but precluded" declaration on the species with the caveat that it would reassess the situation each year (USFWS 2000). Meanwhile, it encouraged state, tribal, and federal agencies (and others) to work together on conservation plans to restore the species so that it would never need to be listed. This resulted in a considerable interstate effort and the formation of the Interstate Black-tailed Prairie Dog Conservation Team with representatives from all 11 states (Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Wyoming) in which the species does- or did- occur. Most states signed a cooperative memorandum of understanding (MOU) with this group and participated in the drafting of a range-wide Conservation and Assessment Strategy (CAS; Van Pelt 1999).

Many states organized their own working groups, including public sector and stakeholder representation, to address state-specific issues. Those groups began to draft state conservation plans that were tiered off the CAS. Meanwhile, the tribal governments, rather than becoming members of the Interstate Team, formed the Intertribal Prairie Ecosystem Restoration Consortium. The states

and tribes began to work on Candidate Conservation Agreements with Assurances (CCAA) with the FWS. The CCAA provides future regulatory certainty to organizational bodies if the state/tribe/landowner has an approved conservation plan and implements it to reverse declines in prairie dog populations within its jurisdiction. Even if the prairie dog should later be listed as a threatened species, those organizational bodies with a CCAA in place will not be held to new regulations beyond those agreed to in the CCAA. Parties holding a CCAA are encouraged to use adaptive management as the prairie dog populations, habitats, and other conditions within their jurisdiction change.

There are also many conservation planning activities being conducted at the municipal and county levels. These government bodies are faced with many challenges, including small property sizes and a diversity of attitudes and land uses. These governmental bodies often use the task force approach to identify stakeholders, problems, and potential solutions to prairie dog issues that result in policy and management documents. Issues, options, and activities at the municipal and county levels were summarized by Witmer et al. (2000).

Difficult components of prairie dog conservation and management involve "rights" issues, such as sovereign rights of tribes, states' rights, and private landowner rights. Despite this, very impressive cooperation is occurring at all levels.

BIOLOGY AND ECOLOGY

Several speakers addressed the biology and ecology of prairie dogs, because it is very important that managers have a good understanding of these topics before making management decisions. Prairie dogs live in colonies with a relatively complex social structure. Each colony consists of a number of coterie, which are basically extended family units. Among rodents, prairie dogs have a relatively low reproductive rate. They also exhibit high mortality rates due to factors such as infanticide, plague outbreaks, and predation. Despite these controls, colonies

rapidly expand once protection is provided (e.g., Fagerstone and Ramey 1996). Detailed surveys often find that many more acres are occupied than originally estimated. Most populations are highly fragmented (i.e., meta-populations exist), and biologists fear that genetic variation may be low in these small, isolated populations. Studies have determined, however, that because of the breeding strategy and good dispersal capabilities of this species, most prairie dog populations maintain moderately high levels of genetic variation. This is partly due to a process of extinction and recolonization of areas occupied by small populations. Conservation biologists have conducted population viability analyses and are integrating reserve size and design considerations to provide essential information to help assure population viability (i.e., to reduce the risk of extinction) despite the meta-population situation. There has been heavy reliance on the keynote book on black-tailed prairie dog biology by John Hoogland (1995), and on his other scientific publications, for obtaining information on the biology and social ecology of the species. Hoogland and numerous other Workshop speakers are currently revising this work; the updated book will cover many other topics, such as prairie dog management.

PUBLIC ATTITUDES

Presentations of the results of attitude surveys regarding prairie dogs provided Workshop attendees with an important element of perspective. A number of surveys have been conducted, both within individual states and on a regional basis. These reveal the many dichotomies in attitudes and the polarized nature of the issues. They also reveal the relative lack of knowledge of the general public about prairie dogs. Typically, rural landowners and persons living near active prairie dog colonies have more negative attitudes towards prairie dogs than urban dwellers and wildlife conservationist activists. Persons who live near prairie dogs or are wildlife conservationist activists tend to be more knowledgeable about prairie dogs. Persons more knowledgeable about prairie dogs often support more "holistic" management of colonies, including some lethal control and not sole reliance on relocation as a solution to conflicts. Speakers representing segments of society (such as farm bureaus, cattlemen's associations, and home builders associations) most directly affected by a potential prairie dog listing (and subsequent regulations) were important contributors to the Workshop.

The results of the surveys suggest the need for public education on matters concerning the ecology and habitats of prairie dogs, their role in the ecosystem, and the management issues and challenges faced by managers, landowners, and health officials. People management often results in more cooperation from landowners and better acceptance and support for prairie dog management policies and plans. Many avenues exist for educating and involving the public.

HABITAT AND VEGETATION MANAGEMENT

The habitat occupied by prairie dogs can be managed in various ways, depending on the location and ownership of the property, the size of the parcel, the land manager or owner's objectives, and the surrounding land uses. On federal and state lands, managers often use techniques such as prescribed burning, managed livestock grazing, barriers between public and private lands, and land exchanges to manage prairie dog colonies and to reduce conflicts.

Prairie dogs affect vegetation and ground cover by foraging and by clipping plants to maintain a more open setting to reduce predation risk. Many persons, however, mistakenly believe that prairie dogs do not have a permanent, damaging affect on prairie vegetation. Speakers informed the attendees of some of the issues and difficulties of vegetation management on occupied sites. Shifts in plant species composition with forbs replacing grasses, unpalatable species replacing palatable ones, reduction in shrub cover caused by stem girdling, and the loss of some plant species are some of the major problems. There may be more total plant cover but reduced litter and ground cover, resulting in greater soil erosion. On the other hand, some rare plant species may survive on the mounds of prairie dogs. Although of lower stature, some plants may have higher nutritional levels because they are maintained under a continuous regime of grazing and clipping. Historically, this may have resulted in the attraction of large grazing herbivores to prairie dog colonies. The picture with non-native cattle is less clear, and concern persists on the part of ranchers that prairie dogs ingest or remove too much of the forage intended for livestock.

With protection, prairie dogs seem to thrive even on sites with abundant noxious, non-native weed cover. The animals may even encourage weed invasion and expansion by selective foraging on palatable native plant species. It is difficult to control noxious weeds on occupied prairie dog sites even with herbicides. Thus, it is difficult to practice integrated weed management and reduce herbicide use. The situation greatly hinders attempts to restore native prairie plant species even with the use of weed control, seeding, and irrigation. In some cases, managers remove the prairie dogs from the site and then attempt to restore native prairie plant species with the intent of re-introducing the prairie dogs at a later date.

POPULATION MANAGEMENT

Historically, land managers and landowners managed (i.e., contained, reduced, or eliminated) prairie dog colonies by extensive and intensive shooting and use of toxicants. With the growing concern over the large-scale reduction in occupied range of prairie dogs and the proposed federal listing, these management activities were largely curtailed on most federal and much state land. Nonetheless, managers are often faced with the challenge of having prairie dog populations where they

don't want them, and not having them where they do want them. Additionally, even in places where managers want and have prairie dogs, the colonies often require control, as they expand into bordering properties where conflicts arise. As such, a zoned management approach is often used once a planning activity is completed and a management plan developed and adopted.

In most situations, managers rely heavily on relocation and population control as essential parts of their management plan. Both of these approaches, however, present many challenges. Relocation is used to re-stock areas where prairie dogs are desired, but where there are no nearby occupied areas to provide a founder population, or where natural dispersal from nearby occupied areas is too slow or not successful in establishing new colonies. Relocation is also used to remove excessive individuals from expanding colonies so that the expansion does not result in land-use conflicts or an increased human health risk from plague. Finally, relocation is used in an attempt to remove all individuals from an occupied area that is scheduled for development. Although lethal control can be—and still is—used in these latter situations, many segments of the public prefer a non-lethal approach (i.e., relocation). Additionally, in some cases, “unwanted” prairie dogs are used as a food source and as predation training subjects for captive-reared black-footed ferrets (*Mustela nigripes*) scheduled for use in re-introduction projects.

There are many considerations to help assure the success of a relocation effort. An appropriate site must be found that is ecologically suitable and will not result in land-use conflicts or legal challenges. It is best if the site has been previously occupied by prairie dogs and old burrow systems still exist. Otherwise, considerable site preparation may be necessary. This could include reducing vegetation height, drilling “starter” burrows, and predator (e.g., coyote, fox) management. With a selected site ready for animals and the appropriate permits in hand, the prairie dog capture work can begin. Prairie dogs are usually captured with the use of cage traps, but in some cases, the techniques of “vacuuming” the animals out of burrows or forcing them out by pumping soapy water down the burrows are used. The effectiveness and humaneness of these latter techniques have not been well documented. Pre-baiting with a food item (e.g., grain, corn) will usually improve trapping success. Some private environmental consulting firms, wildlife conservation organizations, and animal control companies will provide relocation services. Workshop attendees were given a list of resources and vendors where services and supplies could be obtained. Live-trapping is usually time-consuming and expensive, especially when the objective is to capture and move every individual of the source population. It is probably best to use animals from nearby, plague-free source populations and animals that have a social or genetic linkage to one another. Often, upon capture, the animals are taken directly to the site and released, the so-called “hard release” approach. This may

result in relocation failure because the animals quickly disperse from the unfamiliar site or succumb to predation. An alternative is the “soft release” approach, whereby the animals are held at the release site for a period of time to acclimate to the sights, sounds, smells, and climate of the new site. This may involve placing and securing wire-mesh, bottomless cages over the burrow openings so prairie dogs can use the burrows and come above ground, but cannot leave the area and are protected from predation. Usually, food (such as alfalfa or grain) and sometimes water are provided. It is important to monitor the release and to be prepared to intervene if it becomes necessary. A real challenge to managers has been to locate adequate numbers of suitable and acceptable sites for relocation efforts. Well-funded landowner incentive programs (see below) may help resolve this problem.

Because prairie dog colonies can expand and cause conflicts with neighboring landowners, it is often necessary to contain the colony or control colony expansion. We have discussed one way to do that—via trapping and relocating some members of the colony. Other methods include the construction of physical or vegetative barriers to discourage prairie dog movement, encouraging natural predation, and the use of toxicants.

Plastic barriers are a popular approach to the reduction of prairie dog-landowner conflicts because barriers, theoretically, provide a non-lethal solution to colony expansion. Barriers are often less attractive to resource managers because of their expense and high maintenance requirements. The barriers are subject to sun, wind, erosion, and animal (chewing and clawing) damage. They are also considered aesthetically unattractive to some members of the public. Generally, barriers can be breached by some prairie dogs, which burrow under or climb over the barrier, resulting in active burrow mounds outside the barrier. These invading individuals must then be removed and the burrow entrances plugged. Vegetative barriers, using shrubs, are difficult to establish and maintain because of the dry conditions of the prairie landscape and because of animal damage. And, again, some prairie dogs will readily pass through the vegetative barriers.

Natural predation can be encouraged by the creation of artificial perches for raptors, and by placement of raptor nest boxes near prairie dog colonies. These predation enhancement measures work because perches and nesting cavities are often in short supply on the prairies. Resource managers have also experimented with the placement of hay bales to provide cover and protective habitat for mammalian predators. While it appears that these structures are used by predators, it has not been established that the increased predation truly limits colony expansion.

Several toxicants registered by the U.S. Environmental Protection Agency are available to help control prairie dog populations. These include the fumigants aluminum phosphide and gas cartridges, and the rodenticide zinc phosphide. Workshop attendees

were provided with a document summarizing the use of toxicants in prairie dog management. Private animal damage control companies are usually licensed to use toxicants for rodent control and can be contracted to provide such services. The use of toxicants remains very controversial in the public sector; as a result, many agencies are reluctant to use this management tool.

There have been at least two field trials to test the potential of chemical sterilants to control prairie dog populations. While these trials showed promise, there are many difficulties to overcome before these tools become available, including the need for a remote delivery system and the need to get a federal registration that would allow the use of the compounds in the field, especially given that the effects of such compounds would probably not be species-specific.

PLAGUE AND ITS MANAGEMENT

Plague is a non-native disease caused by the bacterium *Yersinia pestis*. Prairie dog colonies are very susceptible to this disease and mortality rates are nearly 100% in infected colonies. Currently, plague is considered the “wild card” of prairie dog colony viability and, relatedly, a major hindrance to the successful reestablishment of black-footed ferrets. There are also human health concerns where prairie dog colonies, which may become infected with plague, occur near suburban housing developments, schools, and city and county parks. We need to learn more about how plague is transmitted between colonies, the ecology of insect vectors, and the possible role of other wildlife vectors. This information would allow us to better predict and manage plague outbreaks. Research is currently underway to find efficient and effective ways to prevent or slow plague outbreaks by the use of insecticides on burrow-dwelling fleas. Other research is directed at development of an oral vaccine bait for plague that could be placed in colonies for consumption by prairie dogs.

We have already mentioned the problems with population fragmentation of prairie dog colonies in terms of their long-term viability and genetic diversity. It is ironic that, because of devastating effects of plague, colonies are probably safer from plague if they are small and relatively isolated (i.e., more than 3 km from neighboring colonies).

LANDOWNER INCENTIVES

Many conservation biologists believe that the future recovery of black-tailed prairie dogs, and the highly dependent black-footed ferret, depends on many large, stable prairie dog colonies being present throughout much of the prairie dog's former range. Because most of the current and former range is under private land ownership, it is essential to obtain the cooperation of landowners in the restoration of the prairie dog. This poses several challenges. Partly because rural economies are not strong anywhere in the country, much rural land is being converted to housing and commercial projects that are not

compatible with the existence of prairie dog colonies. Additionally, landowners need economic incentives (e.g., compensation, tax relief) if they are to restrict the uses and productivity of their lands to accommodate prairie dogs. Incentive programs must have an adequate source of funding for cost-sharing and to enhance the economic productivity of the private lands in the program. Many incentive programs involve land-use leases or easement agreements. Additionally, landowners need some flexibility under these programs so that they can use adaptive management as conditions and populations change and so that they do not feel that their private landowner rights are being infringed upon.

Several federal programs, mostly included under the Farm Bill, are potential sources of assistance for private landowners. These include the Wildlife Habitat Incentives Program, the Environmental Quality Incentive Program, and the Conservation Reserve Program. Many states within the historic range of the black-tailed prairie dog have begun programs of their own. Two examples are the Texas Landowner Incentive Program and the Colorado Shortgrass/Black-tailed Prairie Dog Habitat Incentive Program.

Even non-governmental organizations (NGOs) have initiated programs, such as the Prairie Partners Program of the Rocky Mountain Bird Observatory. Other examples of the services that NGOs and consultants can provide for the restoration of black-tailed prairie dog populations include monitoring populations and trends, assisting in the formulation of policies and the development and implementation of management plans, devising mitigation banking frameworks, conducting research and public outreach, and consensus building.

SUMMARY

Resource managers face many challenges in providing for the conservation of prairie dogs as important prairie ecosystem components. While many managers would like to avoid federal listing of the species, they must also resolve the conflicts that arise between humans and prairie dogs. Technical workshops provide essential information and updates to these resource managers and other interested parties so the agencies, parties, and landowners can better work together to find and implement solutions that provide for the needs of the species, the prairie ecosystem, and human inhabitants of those areas. Impressive progress is being made via the many cooperative efforts throughout the range of the black-tailed prairie dog. Several websites (e.g., www.r6.fws.gov/btprairiedog/quanda.htm) provide background information and periodic updates on this issue. The authors of this paper will provide, upon request, additional information on the Workshop, prairie dog literature references, and participant contact information.

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